

Webinar Series:

Controlled Vocabularies in Archival Description

15 March 2023

Call-in numbers: https://zoom.us/zoomconference

Meeting ID: 813-0921-3615



All lines are muted







Raise your hand to request to unmute



Using Controlled Vocabularies

15 March 2023

Presenters

Kerstin Arnold, Archives Portal Europe Foundation Manonmani Restif and Louis Vignaud, Service interministériel des Archives de France Santiago Muriel, Subdirección General de los Archivos Estatales, and Javier Requejo, Archivo de la Real Chancillería de Valladolid



The what, why, how and when -An introduction to controlled vocabularies

Presenter

Kerstin Arnold (Archives Portal Europe Foundation)





A webinar series on controlled vocabularies

- Two sets
 - Time zones from Europe to Oceania
 - Time zones from the Americas to Europe
- Three sessions each
 - Overview of controlled vocabulary use
 - Encoding controlled terms in archival description
 - Controlled vocabularies in practice

Definitions





The Tower of Babel, Pieter Bruegel the Elder, Museum Boijmans Van Beuningen, Rotterdam (via Wikimedia Commons), PDM

What are vocabularies?

- List of standardised terms or codes
- Controlled
 - Process in place to agree on initial list
 - Process in place to agree on changes
- Authorised
- Available for use

More sophisticated types of vocabularies

Taxonomies

 List of terms with classification, often organised hierarchically (broader/narrower, parent/child), can be polyhierarchical

Thesauri

 Can also include cross-references ("see also") and synonyms, antonyms, and variations ("same as"), may include explanation and history of terms

Ontologies

 More relationship options between terms and more specific types of relationships, relationships between different types of entities, often domain-specific

Background



Access points on ISAD(G)

Access point. A name, term, keyword, phrase or code that may be used to search, identify and locate an archival description.

...based upon the elements of description. The [ir] value ... is enhanced through authority control. ... importan[t] for retrieval

ISAD(G), 2nd edition:

https://www.ica.org/sites/default/files/CBPS 2000 Guidelines ISAD%28G%29 Second-edition EN.pdf





Access points on ISAD(G)

...separate ICA standard, ISAAR-CPF, [...that] gives general rules for the establishment of archival authority records that describe the corporate bodies, persons, and families that may be named as creators in descriptions of archival documents. [...] Vocabularies and conventions to be used with other access points should be developed nationally, or separately for each language.

ISAD(G), 2nd edition:

https://www.ica.org/sites/default/files/CBPS_2000_Guidelines_ISAD%28G%29_Second-edition_EN.pdf

Building a National Finding Aid Network (NAFAN)

- Project in the United States of America
 - September 2020 to February 2023
 - Archival description that supports discovery
 - Analysis of EAD tag usage
 - 145k archival collections encoded in EAD XML
 - 12 regional aggregation services
 - EAD Data Dashboard

NAFAN's EAD Data Dashboard

- Occurrence of the element <controlaccess>
 - Collection or fonds level: 85% of the collections analysed
 - Mostly subjects, followed by names of persons, organisations, and places, plus types of materials
 - Only little on names of families and occupations
 - Nearly nothing on functions
 - Lower description levels: 2% of the components analysed

Further analysis conducted by NAFAN

- From using access terms to using controlled vocabularies
 - 45+% of all access terms mentioned a controlled vocabulary as their source
 - From 46% of names of organisations to 83% of subjects
 - Not even 10% of all access terms pointed to the URI of the specific term within the vocabulary
 - From 3% of names of places to 8.6% of names of persons

Europeana Publishing Framework

- <u>Europeana</u> aggregates and gives access to the continent's digitised cultural heritage
- Three tiers to define <u>metadata quality</u> aiming at improving discovery - "the more you give, the more you get"
 - Enabling elements (i.e. textual information about subjects, places, people, and timespans)
 - Contextual classes (i.e. using vocabulary terms and URIs to represent subjects, places, people, and timespans)

When vocabularies can help



Languages, writing systems, spellings

Tiziano Vecellio

Titian

Тициан

טיציאן

Titien

提齊安諾·維伽略



Tiziano Vecelli

Τιτσιάνο

Tizian

Titiaan

تيتيان

ティツィアーノ・ ヴェチェッリオ

Tiziano Vecellio, Autorretrato, Museo del Prado, Madrid (via Wikimedia Commons), PDM

Localisation

Brötchen

Semmel

Weck

Schrippe

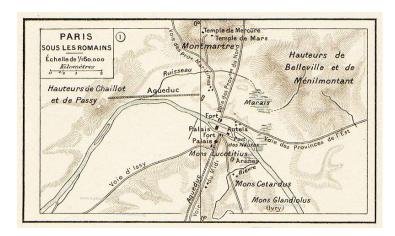


Rundstück

Bömmel

Stüütkes

Historical and contemporary terms

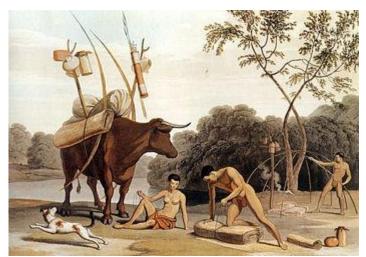




Lutetia **Paris**

Paul Vidal de La Blache, Maps of Paris (Paris sous les Romains) from Atlas Général Histoire et Géographie (via Wikimedia Commons), PDM / Copernicus Sentinel-2 (ESA), Paris (via Wikimedia Commons), CC BY-SA

Culturally inappropriate terms



Original caption: "Korah Hottentots preparing to remove". - Samuel Daniell, African Scenery and Animals, 1805. - The British Museum

Samuel Daniell, Korak-Khoekhoen dismantling their huts, preparing to move to new pastures (via Wikimedia Commons), PDM



Domain- or content-specific terms

Archivbestand 1 in den Abteilung XII mit abgeschlossenen Vorgängen der Vorgangsarten:

Beobachtungsvorgang, Einzelvorgang, Fahndungsvorgang, Geheimer Informator, Geheimer
Mitarbeiter, Gesellschaftlicher Mitarbeiter für Sicherheit, Gruppenvorgang, Inoffizieller Mitarbeiter,
Kontrollvorgang, Objektvorgang, Operative Personenkontrolle, Operativer Vorgang, Teilvorgang,
Überprüfungsvorgang, Untersuchungsvorgang, Zentraler Operativer Vorgang, Zelleninformator,
Feindobjektakte und Kontrollobjektakte und Arbeitsakten von Offizieren im besonderen Einsatz sowie nichtregistriertem Material ehemals KK-erfasster Personen und sonstigem Material mit Personenbezug.

Snapshot of the website of the archives of the Federal Commissioner for the Records of the State Security Service of the former German Democratic Republic (https://www.bstu.de/mfs-lexikon/detail/hauptablage-operative/)

How vocabularies can be used



Retrieval



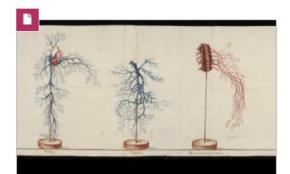
Leisure

Free time, public holidays, and town fairs



Maps

Geographical maps of different type



Medical sciences

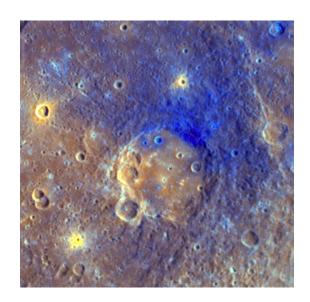
Documents related to research and treaties on medicine

Topics on Archives Portal Europe, https://www.archivesportaleurope.net/explore

Disambiguation







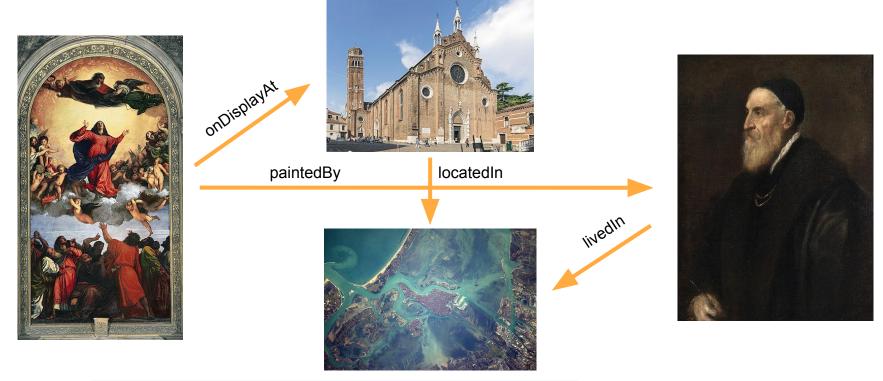
Titian of Oderzo

Titian

Titian crater

Anonymous, Portrait of Titian of Oderzo, photograph by Didier Descouens (via Wikimedia Commons), CC BY-SA / Tiziano Vecellio, Autorretrato, Museo del Prado, Madrid (via Wikimedia Commons), PDM / NASA, Titian crater (via Wikimedia Commons), PDM

Relations



Tiziano Vecellio, Assumption of Mary, photograph by The Yorck Project, CC BY-SA / Didier Descouens, Basilica di Santa Maria Gloriosa dei Frari, CC BY-SA / Tiziano Vecellio, Autorretrato, Museo del Prado, Madrid, PDM / NASA, Venice from the International Space Station, PDM - all via Wikimedia Commons

Which vocabularies can be used



Which vocabulary when and for what

- Organisational, national, international
 - The broader the use, the easier connections can be made with materials from other institutions and other domains
 - The more specific the use, the more specific terms can be applied if required by and useful for the material being described
- Different vocabularies for different types of terms



Examples: Vocabularies supported by Europeana

- Subjects and concepts
 - UNESCO Thesaurus, Wikidata, Library of Congress Subject
 Headings (LCSH), Getty Art & Architecture Thesaurus (AAT)
- Persons
 - <u>Virtual International Authority File</u> (VIAF), <u>Getty Union List of Artist</u>
 <u>Names</u> (ULAN), <u>Library of Congress Name Authority File</u>
 (LCNAF)

Examples: Vocabularies supported by Europeana

- Places
 - GeoNames, Getty Thesaurus of Geographic Names (TGN)
- Genres or types of materials and objects
 - ICONCLASS, Europeana Sounds Genres, Fashion Thesaurus (link to download), <u>Thesaurus of musical instrument names</u> (MIMO)

Examples: National vocabularies

- <u>YSO</u> (Finland)
- BnF Data (France)
- GND Explorer (Germany)
- Semantics.gr (Greece)
- KulturNav (Norway)



Evolutions of Indexing Practices in French Archives

Presenters

Jeanine Gaillard (Archives nationales de France)

Alice Motte (Archives départementales des Landes)

Manonmani Restif and Louis Vignaud (Service interministériel des Archives de France)





Organisation of archives in France

- Service interministériel des Archives de France (Ministry of Culture): defines the rules, coordinates and controls the activities of public archival institutions organised according to the principle of provenance:
 - Archives nationales de France for state and other national level archives with 400 linear km of collections
 - Local archives of which the 97 Archives départementales, created in 1796, are the main archival institutions with 2,800 linear km of archives
- Ministry of Foreign Affairs and Ministry of Defence have their own network of archival institutions
- Archives in public libraries and universities have their own organisation and guidelines to use EAD, as well as two aggregators: Calames and Catalogue collectif de France

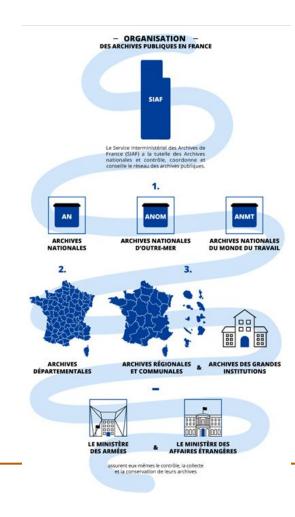






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- 1. A long tradition of indexing
- 2. A national network of federated practice
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- 4. The Archives nationales experience



A long tradition of indexing







A slow maturation of a doctrine

Instructions on description and indexing:

- 1963. Instruction on indexation: use of local vocabularies / indexing based on description.
- 1987. Description of post 1940 archives.
- 1989. Thesaurus W: thesaurus for indexing subjects in local archives.
- 1994. Instruction on description and indexing of post 1940 archives: indexing based on the description / use of vocabularies, mainly local, except for subjects (thesaurus W).
- 2007. State of art of indexing: use of **national vocabularies** (Thesaurus W, PRIAM 3, BORA) and library vocabularies (RAMEAU, Motbis...).



Example of PRIAM 3 at the National Archives

- 1969. A satellite center for contemporary archives opened.
- 1980. PRIAM 3 software based on Texto relational database management system - is used with pragmatism:
 - Summary and indexing of archives directly typed by the producers.
 - Indexing in natural language.
 - Different concepts indexed, particularly the object (subject) and administrative actions to fit cross searching.
- 1987. Decision to group and harmonize terms in a controlled vocabulary repository.
- 2009. About 18,000 fonds described and indexed.
- 2013. Its vocabularies reused in the new archival information system.

PRIAM 3 was designed to be available to archivists AND researchers.



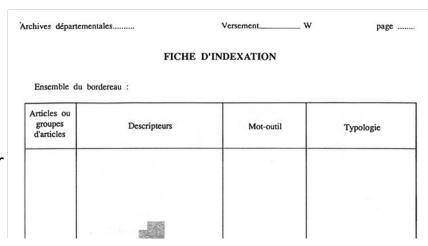
Guidance & legacy





Describing post-1940 archives

- Compulsory elements of a description are:
 - Object → <subject>
 - o Intervention or action → <subject>
 - Type of documents → <genreform>
 - Dates
 - Person → <persname>
 - Organisation → <corpname>
- Indexation based on the description.
- Use of vocabularies, mainly local, except for subjects (thesaurus W).
- Indexation at the appropriate level.





Thesaurus W: indexing subjects in local archives

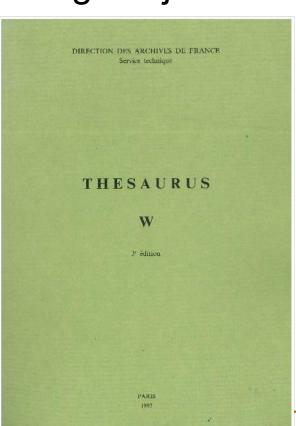
1987, 1989 and 1997

Three editions. Paperback.

1,015 terms organised in 10 classes corresponding to broad administrative functions: administration, justice, society, ...

Alphabetical list of the terms

2 alphabetical lists of terms for administrative actions and types of documents



2009-2012

4th edition: Thesaurus for indexing local archives

1,502 concepts (2,507 terms) with 957 alignments to other vocabularies

Extension to concepts of Medieval and Modern France

Partially adapted to the norm ISO 25964 on thesaurus

Available online with Ark identifiers, in XML-SKOS and in a SPARQL endpoint





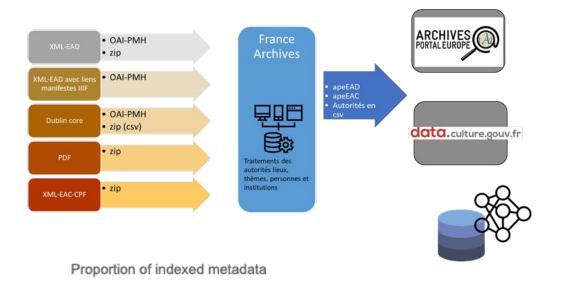
A national network of federated practice







FranceArchives: observatory of indexing practices



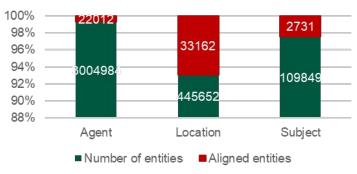
Vocabularies used for alignments:

Places: <u>Geonames</u>

Agents: Wikidata and data.bnf

Subjects: <u>Thesaurus matières</u>

Indexes aligned to external vocabularies







Descriptions

Indexed

43%

The "indexing & description of archives" working group

Context

- The need for shared vocabularies isn't new
- Today, the context is favorable to interoperability

Computerisation of the business (archivists & users)

- Automation is partially based on structured metadata
- The Web promotes the sharing and reuse of vocabularies
- Aggregators (FranceArchives, Archives Portal Europe) are de facto repositories

Working Group

- Created in 2020 by the SIAF with representatives from national, and local archival institutions
- Putting indexing back at the core of archival practices
- Facilitate the user's search of information
- Perimeter: Subject indexing (theme), agents (individuals, families and corporate bodies), locations



Indexing guides for archives

Goal

- Publication of a first version of the guide in 2021
- A Toolkit for archival institutions
- Harmonising practices at the national level

Contents of the guide

- How to develop an indexing policy?
- Implementing its computerised version (XML EAD + software)
- Examples / Presentation of standardised use cases

To be continued...

- Update of the guide (v2 about 2023/24)
- Studies about Web exposed vocabularies
- Updating the French theme thesaurus





Repositories on the Web

Subject / Theme > Creating a dedicated repository

- Update by co-construction with the archive network
- An "archives" repository (French Ministry of Culture) + local satellites
- Alignments + A light and dynamic governance

Agents > Supplementing by subsidiarity

- Archival needs are poorly covered by existing vocabularies (ISNI, VIAF, Wikidata, data.bnf.fr)
- Build a repository by aggregating agents on FranceArchives
- Alignment with national (future « FNE » or "National Entities File") and international vocabularies

Places > Reuse existing offers

- Study of Geonames and national geographic reference systems
- Balance! Each existing offer has an important limitation: geo-historical dimension, updating, durability, scope, standardisation, etc.













The Archives départementales des Landes experience





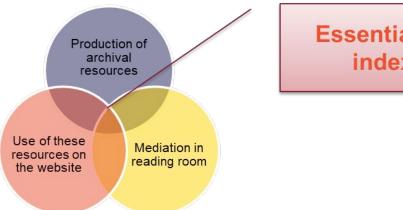


An indexing strategy relying on an user centred approach

Promoting access to documents by users is the core of this strategy based on the following goals:

- Facilitate the search for documents by the public
- Make known the diversity of the archival resources kept by the institution
- Improve the articulation between what is available online and the resources that can only be accessed in the reading room.

A cross-disciplinary project, which involves the entire team of the institution.



Essential lever: indexing

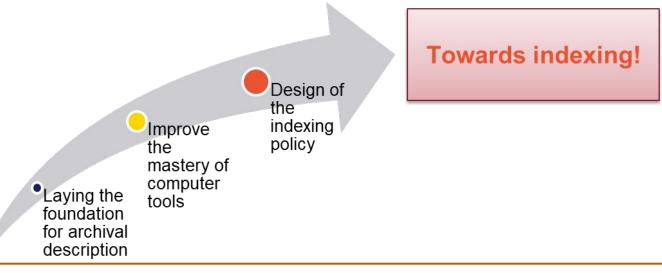




A long-term project, requiring essential prerequisites

A long-term process,

whose main feature lies in the association and support of the entire team:







The indexing options: two intersecting goals, aiming at a medium solution

Local level Promote the knowledge of the Landes fonds

- An "indexing of proximity"
- Creation of local indexing vocabularies, in addition to national ones (specificities of Landes history: people, toponyms, social practices, etc.)
- Thinking about displaying natural language terms for "mainstream" understanding

(Interna)national level

Offer Landes resources a widest visibility

- A "quality indexing"
- Use of national vocabularies
- Use of alternatives terms in addition of canonical terms
- XML tuning: use of EAD attributes to promote alignment with other alignments (@authfilenumber + URI)

The Archives nationales experience







A contrasting situation at the Archives nationales

In 2013 the release of the first archival information system common to all sites of the Archives nationales reflected a new organisation...

without fixing the past heterogeneity of indexing practices:

- Contemporary archives indexed with vocabularies in PRIAM3 / traditional paper finding aids converted in EAD files without recovering the indexes transformed in plain text.
- Use of **17 indexing vocabularies** (places, persons, subjects, functions...) based on PRIAM3 vocabularies and enriched on an as-needed basis **difficult to handle in the AIS**.
- Vocabularies not really interoperable due to their custom DTD.
- Enrichments and alignments with national (e.g. BnF) and international (Geonames) vocabularies in RDF conducted during research projects cannot be reused within the AIS though exposed on GitHub for researchers.



DALL: E - 3D rendering of a construction site with lot of books, computer, tools, pencils and a

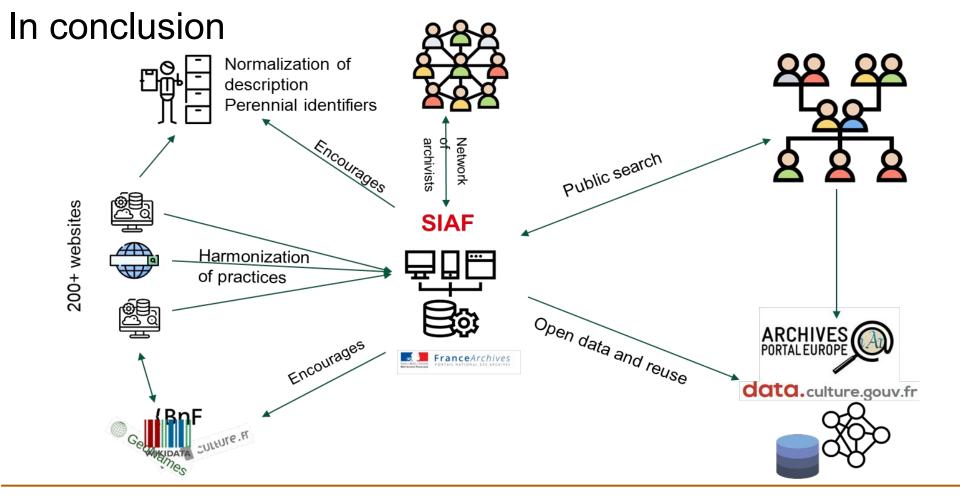
But a profusion of projects

Several projects are planned or in progress to fix legacy problems:

- The functional upgrade of the archival information system to allow shared external vocabularies.
- Creating an archivist's toolbox, promoting sharing experiences between colleagues.
- Opening up to new perspectives such as joining national or international reference systems.















Archives des Bouches-du-Rhône

Thank you for your attention!

Contact:

<u>francearchives.siaf@culture.gouv.fr</u> <u>archivage.numerique.siaf@culture.gouv.fr</u>

Source illustrations: Flat Icon









Controlled Vocabularies in National State Archives of Spain

Presenters

Javier Requejo Zalama (Archivo de la Real Chancillería de Valladolid) Santiago Muriel Hernández (Subdirección General de los Archivos Estatales)



Spanish Standards for Archival Description (NEDA)

National package of standards approved between 2012 and 2018:

- NEDA-MC: Conceptual Model of Archival Description
- NEDA-Req: Basic data for Archival Description
- NEDA-Voc: Vocabulary of Terms.

Basic principle of NEDA Standards:

Archival Description is composed by Archival Entities related between them.









Archival Entities according with NEDA

RECORDS

Record sets, simple records or parts of a record (10 different subtypes)

AGENTS

Corporate Bodies, Families or Persons involved of Records (3 subtypes)

FUNCTIONS

Measures taken by Agents and testified in Records (4 subtypes)









Archival Entities according with NEDA

MANDATES

Provisions that regulate the existence of Agents, Functions and Records.

PLACES

Particular spaces

CONCEPTS, OBJECTS OR EVENTS

Abstract ideas, notions, material items, events or occurrences involved of records.









Mandates

- Regulations.
- Written or unwritten rules.
- Historical or current regulations.
- Official legislation.
- Technical standards.
- etc.









Places

- Terrestrial and extraterrestrial locations.
- Historical and current sites.
- Groupings of territories.
- Jurisdictional or political areas.
- Geographical features.
- Engineering works (roads, bridges, channels, dams, etc.).
- Pilgrimage or commercial routes.
- Any point of polygon that can be identified in a map.
- etc.









Concepts, objects or events

CONCEPTS

- Abstract notions: Religions, political ideas, philosophical trends, disciplines...
- Categories or types of things (occupations, positions, ethnical groups...).
- Legendary, mythical or fictional agents and places.

OBJECTS

- Individual objects that exist in real life (neither persons not records).
- Fictional objects and materials, that not exist in real life.

EVENTS

Periods of time or specific happenings in the past, present or future.









Spanish Archives Portal (PARES)

The <u>Spanish Archives Portal (PARES)</u> is the main platform for the dissemination of Spanish Historical Documentary Heritage, created and managed by the Sub-directorate General of the State Archives of the Ministry of Culture and Sport.

It contains descriptive files and digitised images of the documentary collections kept in the State Archives:

- 5,403,867 records (descriptions of documents).
- 36,770,789 digital objects.
- 72,256 descriptions of no documentary entities









General rules for using Controlled vocabularies in the Spanish Archives Portal (PARES)

DEPENDING ON THE LEVEL DESCRIPTION:

- Funds/Funds Divisions: agents involved in the production, creation, custody, management and accumulation of documents.
- Collections: collecting agents.
- Series: mainly functions and activities.
- Documentary units: all the entities directly related (agents, places, concepts, rules...).

GENERAL RULES:

- Only the entities mentioned in the document descriptions shall be linked.
- Each entity may only be represented by one authorised form/preferred term, regardless of its relationship to the documentation.









Descriptions for each entity, and relations between them and the documents entities.

- Agents: based on ISAAR-CPF, with elements of EAC-CPF.
- Functions: based on ISDF.
- Places, Concepts, Mandates: based on UNE-ISO standards. Thesauri.

RELATIONS:

- The relations are specified according to the types established by various standards: EAC-CPF, NEDA, etc.
- The relationships are represented in the portal as hyperlinks between the unit descriptions of each entity.









Entities and relations. Examples:

- Battle of Lepanto (event):
 http://pares.mcu.es/ParesBusquedas20/catalogo/autoridad/101379
- Miguel de Cervantes (person):
 http://pares.mcu.es/ParesBusquedas20/catalogo/autoridad/117180
- Writers (occupation):
 http://pares.mcu.es/ParesBusquedas20/catalogo/autoridad/103131
- Alcalá de Henares (place):
 http://pares.mcu.es/ParesBusquedas20/catalogo/autoridad/82174
- Document: http://pares.mcu.es/ParesBusquedas20/catalogo/description/12631375
- Consejo de Castilla (institution):
 http://pares.mcu.es/ParesBusquedas20/catalogo/autoridad/46623











Compound record unit related to the license application and printing privilege of El Quijote, by Miguel de Cervantes.

Archivo Histórico Nacional [22] [34]

| Identity statement area | |
|-------------------------------------|--|
| Supplied title: | Compound record unit related to the license application and printing privilege of El Quijote, by Miguel de Cervantes. |
| Reference number: | CONSEJOS,Doc.1159 [Original reference number] |
| Date of formation: | 1604-sm-sd - 1604-09-11 , Valladolid (España) |
| Level of description: | Unidad Documental Compuesta_en |
| Reference code: | ES.28079.AHN//CONSEJOS,Doc.1159 |
| | Location in the archive classification scheme |
| Context | |
| Archival history: | The collection of documents of the Councils Section of the National Historical Archive was created in the eighties of the last century with the purpose of collecting all those documents that, for reasons of preservation, installation or special protection, had to be extracted from their files and preserve separately. Thus, we can find the following casuistry: - Documents on specially fragile supports (such as parchment). - Documents that due to their exceptionally large size have the risk of degrading if they were maintained in a conventional installation. - Documents that due to their exceptionally large size have the risk of degrading if they were maintained in a conventional installation. - Documents that due to their small size were susceptible to being lost easily or even been stolen. - And finally, this collection also included those documents that, due to their special value, required a special installation and greater control when they were consulted by the public (such as the case of the Cuijofe printing license and other documents of similar characteristics). The archival principles always tend to avoid this type of extractions, but when it is the preservation and security of the documents what is at stake, it is preferred form these collections. These are even in the documentary collections of the producing institutions. In the case of the Councils Section, the issue is even more evident when the Council of Castile itself had a differentiated series called "Parchments" which accumulated documentation in this support. |
| Biography / administrative history: | |
| Original reference number: | |
| Name of the creator(s): | Consejo de Castilla (España) |
| Content and Structure | |
| Scope and content: | It contains, among other documents, the Miguel de Cervantes memorial, in which it was requested the license and printing privilege of the the book titled "El Ingenioso Hidalgo de la Mancha" for 20 years [undated] and the report of the royal chronicler Antonio de Herrera, in favor of the aplication requested [dated in Valladolid on September 11, 1604] |
| Conditions of Access and U | Jse |
| General accessibility conditions: | ©MCD, Archivos Estatales (España). La difusión de la información descriptiva y de las imágenes digitales de este documento ha sido autorizada por el titular de los derechos de propiedad intelectual exclusivamente para uso privado y para actividades de docencia e investigación. En Inigiún caso e autoriza su reproducción con finalidad flucrátiva ni su distribución, comunicación pública y transformación por cualquier medio sin autorización expresa y por escrito del propietario. |
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| Description indices: | Cervantes Saavedra, Miguel de (1547-1616) Cervantes Saavedra, Miguel de (1547-1616). Don Quijote de la Mancha Gallo de Andrada, Juan Herrera Tordesillas, Antonio de (1549-1626) Licencias de impresión Ramírez de Arellano, Gil (Ica 1555-1618) |
| C4-444: | 01 |









Entities and relations. Examples:

- Document: http://pares.mcu.es/ParesBusquedas20/catalogo/description/12893808
- Archivo General de Simancas (institution):
 http://pares.mcu.es/ParesBusquedas20/catalogo/autoridad/46558
- Turriano, Juanelo (person):
 http://pares.mcu.es/ParesBusquedas20/catalogo/autoridad/151254
- Clockmasters (occupation):
 http://pares.mcu.es/ParesBusquedas20/catalogo/autoridad/103131
- Toledo (place): http://pares.mcu.es/ParesBusquedas20/catalogo/autoridad/82230











Plan of a machine to raise fresh water from the river Tajo to the Alcazar of Toledo and supply the city.

Archivo General de Simancas [22] [->

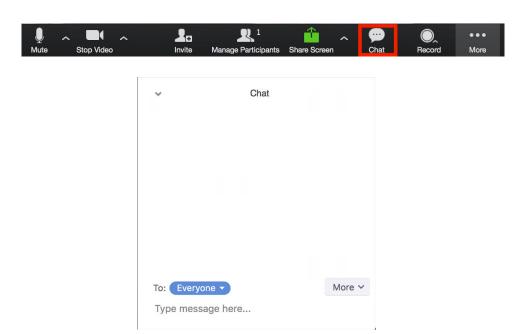
| | | 100 |
|--|--|---|
| Identity statement area | | |
| Supplied title: | Plan of a machine to raise fresh water from the river Tajo to the Alcazar of Toledo and supply the city. | |
| Reference number: | MPD,27,3 | |
| Date of creation: | 1561-10-17 , Toledo (España) | |
| Level of description: | Unidad Documental Simple_en | |
| Reference code: | ES.47161.AGS/MPD,27,3 | |
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| Content and Structure | | |
| Content and Structure Scope and content: | Well know as clockmaster of Charles V. Juanelo Turriano (it. Giovanni Turriano, ca.1505-1585) started as clockmak Milano, where he stood up by his tricky machines. He could take contact with the emperor after his reconstruction or complicated astronomical calendar of Giovanni Dondi, a gift of the city of Milano to Charles V; since then he worked the emperor until his death in 1558, and then for his son Philip II until his own death. Charles V was very interested clockery and Turriano built several clocks and automata for him, but Philip II engaged Turriano mainly as civil engine in the same way that other European engineers (Italians Antonelli and Spanocchi, Flemish Van Langeren and Spani Herrera and Toledo). In 1565 Turriano was hired to build an engine to supply the Alcázar of Toledo with fresh water 1 the nearby Tajo river. He succeeded to build it in three years, and so well done that he was hired to build another on The machine was at the time the highest water elevator in the world, providing Toledo with 17 cubic meters of water day raised from 100 m below. | the for n er, sh rom e. |
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| Scope and content: Conditions of Access and Us | Milano, where he stood up by his tricky machines. He could take contact with the emperor after his reconstruction or complicated astronomical calendar of Giovanni Dondi, a gift of the city of Milano to Charles V; since then he worked the emperor until his death in 1558, and then for his son Philip II until his own death. Charles V was very interested clockery and Turriano built several clocks and automata for him, but Philip II engaged Turriano mainly as civil engine in the same way that other European engineers (Italians Antonelli and Spanocchi, Flemish Van Langeren and Spani Herrera and Toledo). In 1565 Turriano was hired to build an engine to supply the Alcäzar of Toledo with fresh water in the nearby Tajo river. He succeeded to build it in three years, and so well done that he was hired to build another on The machine was at the time the highest water elevator in the world, providing Toledo with 17 cubic meters of water day raised from 100 m below. 66 ©MCD. Archivos Estatales (España). La diffusión de la información descriptiva y de las imágenes digitales de este documento ha sido autorizada por el titular de los derechos de propiedad intelectual exclusivamente para uso priva para actividades de docencia e investigación. En ningún caso se autoriza su reproducción con finalidad lucrativa ni distribución, comunicación pública y transformación por cualquier medio sin autorización expresa y por escrito del | the for n eer, sh rom e. a |
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